

CLAIMS

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1. A delivery system for controlled dispensing of a substance, the system comprising:

10 a cartridge having at least two compartments for storing material components and a mixing means for mixing the material components to form a substance;

a plunger for causing the material components to flow into the mixing means, the plunger having at least two pistons for sliding correspondingly into the at least two compartments;

and

15 actuation means for providing controlled dispensing of the mixed material components.

2. The delivery system according to claim 1, further comprising

20 reservoir means for receiving the substance exiting the mixing means of the cartridge, wherein the reservoir means is compressible by the actuation means.

3. The delivery system according to claim 2, wherein

25 the reservoir means comprises a bladder attachable to an outlet of the cartridge and

the actuation means comprises a lever for pressing the bladder in a continuous and/or stepwise manner such that, with each press of the bladder by the lever, a predetermined amount of substance can be extruded from the bladder thereby providing controlled dispensing of the substance.

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4. The delivery system according to claim 2, wherein
the reservoir means comprises a sleeve which is movable over the
exterior surface of the cartridge and a cavity for receiving the substance
exiting the cartridge, the cavity being formed by the interior surface of the
sleeve and the exterior surface of the cartridge.
5. The delivery system according to claim 4, wherein
the actuation means comprises a lever having a pawl, the lever
being attached to the sleeve, the pawl engaging with the cartridge and
the actuation means being operable in a stepwise manner such that
when the pawl engages the cartridge, the cartridge is caused to move
forward toward the cavity thereby extruding the substance from the cavity
and providing controlled dispensing of the substance.
6. The delivery system according to claim 2, wherein
the reservoir means comprises a chamber for receiving the
substance, the chamber being attachable to the outlet of the cartridge,
and
wherein the actuation means comprises a lever, a connecting rod
and a piston attached to the connecting rod and slideable into the
chamber, the actuation means being operable in a continuous and/or
stepwise manner such that when the lever is engaged, the connecting
rod is caused to move and to drive the piston forward into the chamber
thereby causing a pre-determined amount of the substance to be
extruded from the chamber.
7. The delivery system of any one of claims 1 to 6, wherein
the cartridge comprises an actuator part and a material receptacle
having at least two compartments for storing material components, the
material receptacle being separable from the actuator part.

8. A sealing system for sealing a cartridge of a delivery system, the system comprising:
- a sealing material;
 - a cartridge having at least two compartments for storing material components, the at least two compartments being sealed by the sealing material; and
 - a plunger having at least two pin rods for corresponding to the at least two compartments;
- wherein, as the plunger is moved forward, the at least two pin rods are adapted to penetrate the sealing material thereby pushing the material components within the compartments forward toward the front of the cartridge such that tight sealing is provided where the sealing material is penetrated by the pin rods.
9. The sealing system according to claim 8,
- wherein the plunger further comprises at least two pistons, the at least two pistons being located within the respective compartments behind the sealing material;
 - wherein, as the plunger is moved forward, the at least two pin rods are adapted to penetrate the sealing material and to contact the corresponding pistons and to thereafter push the pistons forward thereby pushing the material components forward toward the front of the cartridge
10. A method of sealing a cartridge for a delivery system, the method comprising:
- providing a sealing material;
 - providing a cartridge having at least two compartments for storing material components;
 - placing the sealing material over the length of the at least two compartments thereby sealing material components with the compartments;

providing a plunger having at least two pin rods corresponding to the at least two compartments;

moving the material components within the compartments by pushing the plunger forward,

5 wherein, as the plunger is pushed forward, the at least two pin rods penetrate the sealing material thereby pushing the material components within the compartments forward toward the front of the cartridge such that tight sealing is provided where the sealing material is penetrated by the pin rods

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11. A method of sealing a cartridge for a delivery system, the method comprising:

providing a sealing material;

15 providing a cartridge having at least two compartments for storing material components;

providing a plunger having at least two pistons for sliding correspondingly into the at least two compartments and at least two pin rods corresponding to the at least two pistons;

positioning a piston in each of the compartments of the cartridge;

20 placing the sealing material over the at least two compartments and the at least two pistons positioned within corresponding compartments thereby sealing the material components and pistons within the compartments;

25 moving the material components within the compartments by pushing the plunger forward,

30 wherein, as the plunger is moved forward, the at least two pin rods are adapted to penetrate the sealing material and to contact corresponding pistons underneath the sealing material and to thereafter push the pistons forward thereby pushing the material components within the compartments forward toward the front of the cartridge.

12. A self-opening closure system for a cartridge for a delivery system, the system comprising:

a cartridge having at least two compartments for storing material components and a mixing means for mixing the material components to form a substance;

a plunger having at least two pistons for sliding correspondingly into the at least two compartments; and

a sealing material for sealing the material components within the compartments;

wherein

the cartridge further comprises at least two compartment outlets corresponding to the at least two compartments and at least one inlet in fluid communication with the mixing means,

the at least two compartment outlets and inlet being sealed in an area underneath the sealing material, wherein the sealing material is permanently sealed along the perimeter of the area and non-permanently sealed in the area above the at least two compartment outlets and the at least one inlet such that, before the plunger is activated, the non-permanent sealing is sufficient to prevent the material components from exiting through the compartment outlets and/or from entering the inlet of the mixing means and such that, when the plunger is activated, the pressure caused by the material components pressing against the sealing material is sufficient to cause the non-permanent sealing to open thereby allowing the material components to exit through the compartment outlets and enter into the inlet of the mixing means.

13. The self-opening closure system according to claim 12,

wherein the cartridge comprises an inlet in fluid combination with an intermediate chamber, and

wherein, when the plunger is activated, the pressure caused by the material components pressing against the sealing material is sufficient to cause the non-permanent sealing to open thereby allowing

the material components to exit through the compartment outlets and enter the intermediate chamber before entering the inlet of the mixing means.

- 5 14. A delivery system for controlled dispensing of a substance, the system comprising:

a cartridge having at least two compartments for storing material components and a mixing means for mixing the material components to form a substance;

10 a plunger having at least two pistons corresponding to the at least two compartments; and

a sealing material for sealing the material components within the compartments,

15 wherein the at least two compartments are grooved-shaped and the at least two pistons are correspondingly shaped to the compartments, and wherein, as the plunger is moved forward, the pistons press an exterior surface of the sealing material as the pistons move forward which compresses the compartments so as to press the material components forward toward the front of the cartridge.

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15. The delivery system of claim 14, wherein the circumference of compartments is tapered and the respective movement of the pistons correspond to the tapering.

- 25 16. The system according to any of the preceding claims, further comprising at least one of the following materials: enzyme-containing compositions; dental primers; bondings; etching gel/liquids; varnishes; glue, such as cyanoacrylate; pharmaceuticals, such as liquids and/or gels; a substance for the treatment or prevention or identification of caries; a substance for
30 the prevention or identification or removal of plaque; a substance for root canal treatment; a substance for the removal of carious or decayed or

infected dentine or enamel and/or a substance for the removal of denaturated dentine.

- 5 17. Kit with a system according to any one of the preceding claims further comprising at least one of the following members: dental instruments, such as excavators, in particular disposable dental instruments; brushes, particularly of different sizes and hardnesses; disposable cartridges so that the system can be used as a refillable system; gloves and/or at least any one of the materials according to claim 16; and/or bonding and/or etching agent/gel.
- 10 18. A method of sealing for a cartridge for a delivery system, particularly according to any one of the preceding claims, the method comprising:
- 15 providing a cartridge having at least two compartments for storing material components and a mixing means for mixing the material components to form a substance;
- providing a plunger having at least two pistons for sliding correspondingly into the at least two compartments; and
- providing a sealing material for sealing the material components within the compartments;
- 20 providing the cartridge with at least two compartment outlets corresponding to the at least two compartments and at least one inlet in fluid communication with the mixing means, the at least two compartment outlets and inlet being sealed in an area underneath the sealing material,
- 25 wherein the sealing material is permanently sealed along the perimeter of the area and non-permanently sealed in the area above the at least two compartment outlets and the at least one inlet such that, before the plunger is activated, the non-permanent sealing is sufficient to prevent the material components from exiting through the compartment outlets and/or from entering the inlet of the mixing means and such that,
- 30 when the plunger is activated, the pressure caused by the material components pressing against the sealing material is sufficient to cause the non-permanent sealing to open thereby allowing the material

components to exit through the compartment outlets and enter into the inlet of the mixing means.

19. A system, kit and/or method according to any one of the preceding
5. claims with further features being in combination or alone derivable from the figures.

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